REMARKS

These remarks are in response to the Office Action mailed April 5, 2005. As required by the Examiner, an abstract of the disclosure is attached on a separate sheet for this application.

Claim 1

Claim 1 is directed to a proof generation method that includes receiving halftoned print data that has been produced by a first halftoning technique, and applying a different halftoning technique to that print data. This claim therefore requires that there be superimposed halftoning operations on a same data stream.

By superimposing two halftoning techniques together, the claimed method can yield a proof that represents both the halftone pattern and the colors of a press. This can allow *Moiré* patterns on the press to be predicted from the proof more accurately. And predicting *Moiré* patterns can allow a user to correct them before undertaking the potentially expensive and time consuming task of running the print job on the press.

Claim 1 stands rejected as anticipated by Spence. As shown in Fig. 1, reproduced below, Spence discloses an image matching technique in which a set of digital separations 110 can be used to obtain a set of screened halftone separations 120 or can be used directly within a direct digital color proofing system 143 (col. 13, lines 42-45).

The office action states that Spence provides a path that passes first to digital separations 110 into CMYK digital data, and then to halftone separation 120. It goes on to argue that the digital separations constitute a first halftone technique and the halftone separation constitutes a second halftone operation.

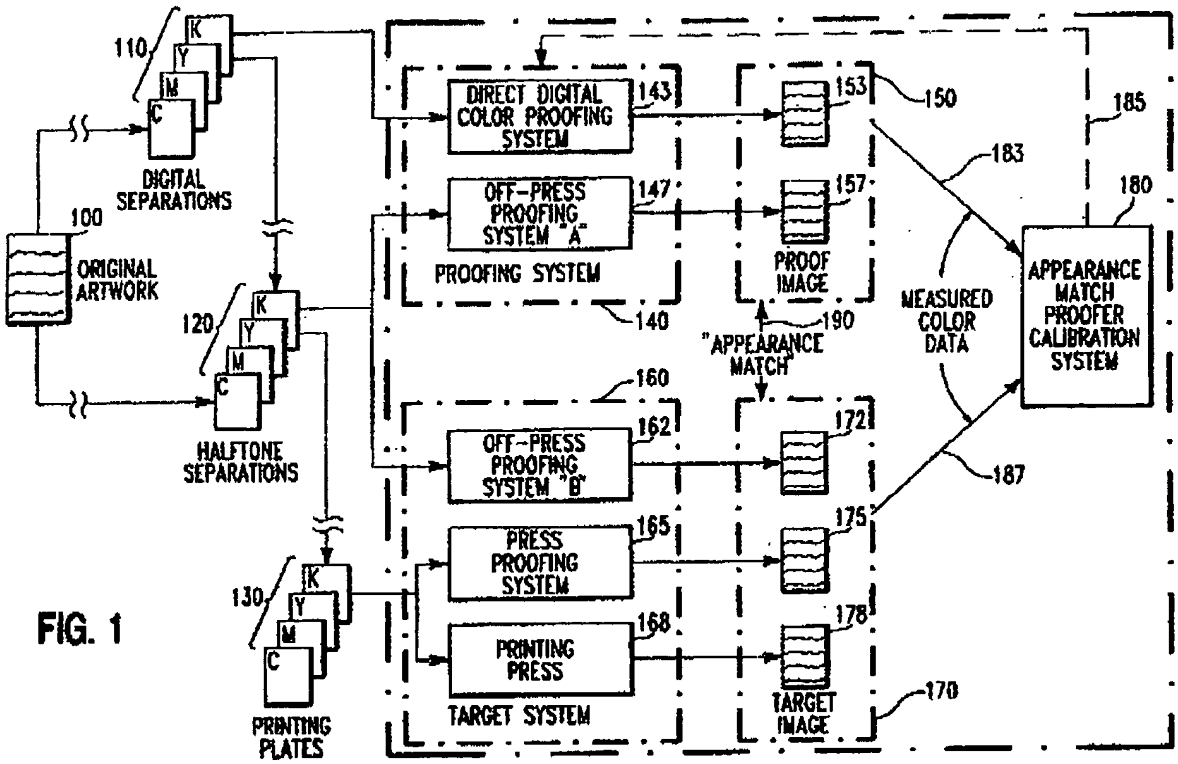

FIG. 1

Applicant respectfully requests reconsideration because Spence's usage and evidence of usage in the industry indicates that the process of producing digital separations is not a halftoning process. Color separations are derived by isolating each color from an image so that they can be printed with different ink colors (see Corel Photo-Paint user manual, pages 597-598, Corel Commercial Printing Guide page 1-9—copies attached). In a digital color separation continuous (or real numbered intensity values) are quantized into discrete or digital values. Halftone screens, in contrast, are used to convert continuous images into images made up of dots where the size of the dots determines different levels of shading (see Corel Photo-Paint user manual, pages 595, Corel Commercial Printing Guide page 1-8). These screens need to be applied to color separations if the separations are to be printed on a halftone printer (Corel Photo-Paint user manual, pages 599).

When preparing a continuous tone image for printing on a commercial printing press, it is not uncommon to perform both a color separation and a halftoning operation, and the result is a set of halftone separations. It may sometimes be tempting for graphic

artists to think of the two operations as a single process, and their software or printer may only make them available together. But it is clearly not always necessary to perform both of these operations together. Continuous tone printers, for example, can print from color separations that are not halftoned.

Spence is also careful to maintain the distinction between color separations and halftoned images. At col. 13, lines 30-39, for example, Spence clearly treats the two differently:

> "In order to render a halftone color image of continuous tone ("contone") original artwork 100, e.g., a color transparency, through apparatus 5, a set of digital separations 110 may be made for this artwork, through processes not shown or relevant here. A set of (screened) halftone separations 120 is also made for this artwork, through processes not shown or relevant here, either from digital separations 110 or directly from the original artwork 100"

Careful reading of Spence therefore indicates that digital separations are different from screened halftone separations. The separation process is simply the first step in rendering a halftone color image for printing on a four-color press. In light of Spence's usage and usage in the industry, therefore, and absent any further explanation from Spence, one of ordinary skill in the art would understand the digital separations 110 to be quantized continuous tone separations. Spence therefore fails to disclose the receipt of halftoned print data that has been produced by a first halftoning technique in combination with the application of a different halftoning technique to that print data, as now required by amended claim 1. The anticipation rejection of claim 1 should therefore be withdrawn.

Nor does Spence render obvious the invention as now claimed in amended claim 1. Spence teaches a method of generating a color match through the adjustment of solid and tint densities. But nowhere does he fairly disclose the application of two different superimposed halftoning techniques, nor does he present any reasonable rationale for undertaking them, such as to address the issue of *Moiré* patterns. The Spence patent therefore would not render obvious the invention as it is now claimed in amended claim

1. Independent claims 17 and 18 also distinguish over the prior art of record for at least reasons similar to those advanced in support of claim 1.

<u>Claim 19</u>

Claim 19 is directed to a proof generation method for ink jet proof printers that includes receiving print data to which a first halftoning technique has been applied to obtain screen image data representing a plurality of screen dots. The invention also includes creating one or more lightened areas, where direct deposition of colorant is to be lightened within a sub-area of at least some of the screen dots to be printed. The method is optimized to accurately reproduce the shaded visual image that would be printed on a printing press.

These lightened areas are within the edges of the dot. They therefore allow dots to be made to appear lighter, without changing their size. This can allow copy from a proof printer to more closely match the dots of a particular printing press, even if the color densities of the inks used on the two machines do not match. And more closely matched dots can make it easier to evaluate a proof for *Moiré* issues before undertaking the potentially expensive and time consuming task of running a corresponding print job on the press.

Claim 19 stands rejected as obvious over Spence in view of Vink. But neither Spence nor Vink teach lightening areas within the edges of screen dots. Spence tries to match colors on a dye sublimation printer to output of an offset press by determining changes in values of process color solid and tint densities. But these changes are then converted to dot size recommendations (col. 24, lines 37-38, col. 24, lines 32-34). Nowhere in Spence is there any disclosure or suggestion to lighten areas within the edges of screen dots, nor does Spence address *Moiré* patterns in any meaningful way.

And Vink discloses a method of silk screen printing (serigraphy), in which a free flowing ink is pressed through screen cells of a screen, for use on materials such as posters, wallpaper, printed circuit boards, textiles, pottery, or floor tiles (col. 1, line 19-21, col. 2, line 60-65). Vink's disclosure discusses the reduction of *Moiré* patterns by appropriate orientation of the screens with respect to each other. But Vink does not address matching *Moiré* patterns on a press and makes no mention of any attempts to

lighten areas of screen dots to achieve this end. Thus neither Spence nor Vink, whether taken alone or in combination, disclose or suggest the invention as claimed in claim 19.

Furthermore, one of ordinary skill in the art would not be motivated to combine the teachings of the Spence and Vink applications in the manner set forth in the office action. This is because one of ordinary skill in the art would not be motivated to produce a proof for an offset press using the completely different technique of serigraphy. Specifically, offset printing is a relatively inexpensive technique in which a plate mounted on drum typically makes large numbers of high-resolution copies on plain paper. Serigraphy is instead typically a relatively expensive, low-resolution technique in which a squeegee is mechanically drawn along a screen to squeeze ink through the screen onto large format substrates, such as posters or wallpaper, or non-paper substrates, such as textiles, tiles, or printed circuit boards. It would therefore be extraordinarily unlikely that one of ordinary skill in the art would want to try to make proofs of material to be printed on offset presses with serigraphy. It may even be impossible to match the resolution of modern offset printers with serigraphy.

Independent claims 24-26 and 33-32 also distinguish over the prior art of record for at least reasons similar to those advanced in support of claim 19.

Claim 34

Claim 34 is directed to a proof generation method for ink jet proof printers that includes receiving print data to which a first halftoning technique has been applied, with this technique producing a plurality of dots. The method also includes altering at least a plurality of areas distributed within the edges of at least some of the dots with substantially the same color alteration, and providing the data to a proofing printer different from the target halftone printing press.

Performing substantially the same color alterations in the dots allows their color to be changed, without changing their size. This can permit copy from a proof printer to more closely match the dots of a particular printing press, even if the inks used on the two machines do not match. And more closely matched dots can make it easier to evaluate a proof for *Moiré* issues before undertaking the potentially expensive and time consuming task of running a corresponding print job on the press.

Claim 34 stands rejected as obvious over Spence in view of Vink. But neither Spence nor Vink teach performing substantially the same color alteration in a plurality of dots. As presented above, Spence tries to match colors on a dye sublimation printer to output of an offset press by determining changes in values of process color solid and tint densities. But these changes are then converted to dot size recommendations (col. 24, lines 37-38, col. 24, lines 32-34). Nowhere in Spence is there any disclosure or suggestion to alter a plurality of areas of screen dots with substantially the same color alteration.

And as presented above, Vink discloses a method of silk screen printing (serigraphy), in which a free flowing ink is pressed through screen cells of a screen, for use on materials such as posters, wallpaper, printed circuit boards, textiles, pottery, or floor tiles (col. 1, line 19-21, col. 2, line 60-65). Vink's disclosure discusses the reduction of *Moiré* patterns by appropriate orientation of the screens with respect to each other. But Vink makes no mention of any attempts to alter a plurality of areas of screen dots with substantially the same color alteration. Thus neither Spence nor Vink, whether taken alone or in combination, disclose or suggest the invention as claimed in claim 34.

Furthermore, as presented above, one of ordinary skill in the art would not be motivated to combine the teachings of the Spence and Vink applications in the manner set forth in the office action. This is because one of ordinary skill in the art would not be motivated to produce a proof for an offset press using the completely different technique of serigraphy. Specifically, offset printing is a relatively inexpensive technique in which a plate mounted on drum typically makes large numbers of high-resolution copies on plain paper. Serigraphy is instead typically a relatively expensive, low-resolution technique in which a squeegee is mechanically drawn along a screen to squeeze ink through the screen onto large format substrates, such as posters or wallpaper, or non-paper substrates, such as textiles, tiles, or printed circuit boards. It would therefore be extraordinarily unlikely that one of ordinary skill in the art would want to try to make proofs of material to be printed on offset presses with serigraphy. It may even be impossible to match the resolution of modern offset printers with serigraphy.

Independent claims 40 and 41 also distinguish over the prior art of record for at least reasons similar to those advanced in support of claim 34. The remaining claims are

dependent, and should be allowable for at least the reason that they depend on an allowable claim. Claim 42 is new and its examination is respectfully requested.

This application should now be in condition for allowance and such action is respectfully requested. The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment, to Deposit Account No. 50-0750.

Respectfully submitted,

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Dated

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ABSTRACT OF THE DISCLOSURE

A proof generation method is disclosed for proof printers. The method includes receiving halftoned primary color print data to be printed on a target halftone printing press. This halftoned primary color print data has been produced by a first halftoning technique, and is at least comparable to a target halftoning technique used by the target halftone printing press. A second, different halftoning technique is also applied to the print data. The two halftoning techniques are selected to cause a dot size in data provided to the proofing printer to more closely match a dot size for the halftone printing press.


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PHOTO-PAINT 8

Corel PHOTO-PAINT user manual - Version 8.0

name of the file, the date and time the work was created, and the plate number (useful when printing color separations). When you enable the Print File Information check box, you can specify a job name (also called a slug line) that will be included with the file information.

To see page numbers and file information, the paper on which you are printing must be larger than the page size of the document you are printing. However, you can print file information inside the document's page by enabling the Position Within Page option.

❖ **To print page numbers**

1. Click File, Print Preview.
2. Click the *Marks Placement tool.*
3. Enable the *Page Numbers button.*

❖ **To print a file information**

1. Click File, Print.
2. Click the Prepress tab.
3. Enable the Print File Information check box.
4. Enable the Position Within Page check box if you want the file information to appear on the document's page.
5. Type a job name in the Job Name/Slug Line box if you want the Job Name/Slug Line to be different.

Positioning printers' marks

You can change the position of all the printers' marks by changing the position of the Marks Alignment Rectangle in the Print Preview window.

❖ **To change the position of printers' marks**

1. Click File, Print Preview.
2. Click the *Marks Placement tool.*
3. Type values in the Top, Bottom, Left, and Right boxes on the Property Bar.

- You can also change the position of printers' marks by dragging the bounding box in the Print Preview.

Printing a job information sheet

Including a job information sheet with your print job will help your service bureau or print shop to deal with any problems that arise more effectively.

❖ **To print a job information sheet**

1. Click File, Print.
2. Click the Miscellaneous tab.
3. Enable the Print Job Information Sheet check box.
4. Click the Info Settings button and specify the categories of informatio that are to be included, and specify whether the job information is to l saved to a file, printed, or both.

Working with bitmaps and halftone screens

If the document you are sending to the service bureau or print shop contain: bitmaps (e.g., scanned images or photographs), you will need to set up halftc screens for your bitmaps.

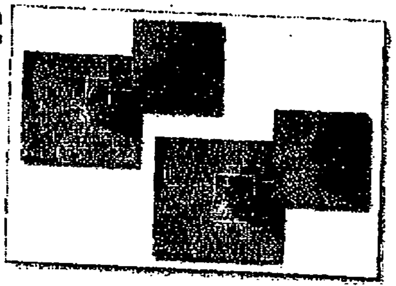
Halftones

Commercial printing presses are unable to produce true shading but can crea the illusion of shading by printing images made up of tiny dots. The size of tl dots determines the different levels of shading (i.e., the bigger the dots, the darker the shade). A halftone screen is necessary to convert images with tru shading into images made up of tiny dots.

Originally, a halftone screen was an opaque screen with thousands of tiny hc An image with shading was photographed through this screen using special photographic paper or film. The resulting image would consist entirely of do This image could then be used to create printing plates.

Now, however, you can create halftone images without using screens or cam To ensure that your bitmaps print correctly, you must correctly set the halftc screen frequency and bitmap resolution.

The image on the left shows a close-up of a bitmap. The image on the right shows a close-up of a halftone.



Halftone screen frequency

The halftone screen frequency determines the number of dots used to create the image. The screen frequency is measured in lines per inch (lpi). This measurement refers to the number of rows of dots per inch.

When you choose a screen frequency, remember that the higher the screen frequency, the sharper the image. However, there are limits to screen frequency which are determined by the type of printing press on which you are printing, and the type of paper you are using. In general, a screen frequency of 85 lpi works on newsprint, and a frequency of 100 lpi works on bond and glossy paper. If possible, consult your service bureau or printing shop to find out the screen frequency you should use.

Bitmap resolution

When creating a halftone image, the bitmap's resolution, measured in dots per inch (dpi), should be no less than twice the halftone screen frequency. For example, if you are using a 150 lpi screen, the bitmap should have a resolution of at least 300 dpi.

Using Open Prepress Interface

Corel offers Open Prepress Interface (OPI) support. OPI is a way for you to include high resolution scanned images in your work without dramatically increasing the file size. To accomplish this, your service bureau professionally scans your images on a high-end scanner. They keep the high-resolution version of the scans and give you low-resolution equivalents. You import the low resolution images into your documents, using them for position only (FPO). Working with FPO images keeps your document size smaller and speeds up screen redrawing time. When you send your print job back to the service bureau for final imaging to film, your high resolution files are automatically substituted.

- You must import FPO images correctly or they will not be replaced at print time.
- You can only scale, crop, and rotate FPO images. You can't apply any other effects.

Setting the halftone screen frequency

If you are printing halftone images, you need to set the screen frequency properly. Consult your service bureau to determine the appropriate screen settings.

This option is available for PostScript devices only.

◆ To set the screen frequency

1. Click File, Print.
2. Click the PostScript tab.
3. Type a screen frequency (in lines per inch) in the Screen Frequency box. Consult your service bureau for the optimum setting for your job.

- When the screen frequency is set to Default, the image is printed using the default screen frequency of the output device.

Creating color separations

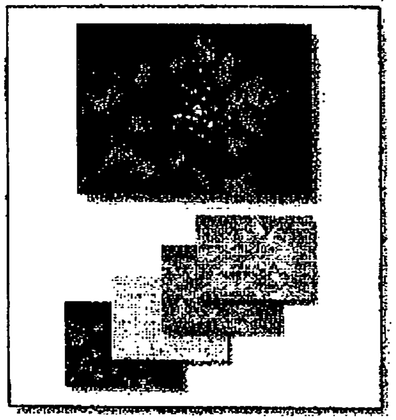
If you are sending color work to a service bureau or printing shop, either you or the service bureau will need to create color separations.

Color separations are necessary because a printing press applies only one color of ink to a sheet of paper at a time. A color separation is created by first isolating each color element in an image. Each color element is then used to create a sheet of film. Each sheet of film is used to apply one color of ink to the sheet of paper.

Printing presses produce color using either process color or spot colors. The number of colors you plan to use will be the main factor in deciding which method to use.

Process color

If your project requires full color (e.g., it contains scans of color photographs), then you will need to use process color. Process color is a method of producing virtually any color using only four ink colors: cyan, magenta, yellow, and black (known as CMYK). The final colors are produced by mixing percentages of these four inks. Process color only requires four color separations.



Corel now supports a new type of process color, called Hexachrome. Hexachrome color uses six different ink colors (cyan, magenta, yellow, black, orange and green) to produce full color images. To use Hexachrome color effectively, use the Hexachrome color palette. Talk to your service bureau about whether you should use Hexachrome color.

Spot color

If your project makes use of only one, two, or three colors (including black) then you'll probably use spot colors, such as those offered by PANTONE. Spot color uses a different ink for each color and each color requires its own color separation. If your budget is limited, consider

- obtaining a two-color look by printing on colored paper and using only one spot color
- using tints (percentages) of spot colors to create shadows or highlights, thus giving the impression of a broader color range

Both process and spot color

Some projects require both spot and process colors. For example, a marketing brochure may require the use of a spot color to faithfully render the corporate color and the use of process color to reproduce scans of photographs. Remember though, that each additional spot color requires extra film, plates and ink, adding to the cost of printing.

A word about palettes

You can work on different elements of your document from different palettes or different color models. Ultimately however, all colors must be printed with process and spot color inks. Colors defined in the RGB or HSB models are translated automatically into CMYK (process) values. As for spot colors, you can convert them to CMYK at printing time. For more information see "Working with color" on page 359.

- Pay close attention to the number of colors used, especially if you are importing clipart. Make sure you only use the colors you have chosen (i.e., process color or spot color).

Printing color halftones

If you are printing process color halftones, you need to use a halftone screen for each different color separation (see "Working with bitmaps and halftone screens" on page 595 for more information).

Screen angle

Because each halftone screen consists of a regular pattern of shapes, it creates a pattern on the printed image. When the separations are combined, the patterns created by each separate halftone screen interact. This interaction can create an undesirable effect, called a moiré pattern.

Moiré patterns are eliminated by changing the screen angle of each color separation. If you were using an actual screen and a camera, you would rotate the screen 15 degrees for each separation by hand. However, since you are using software to create halftone screens, you have to change certain print options to change the screen angle.

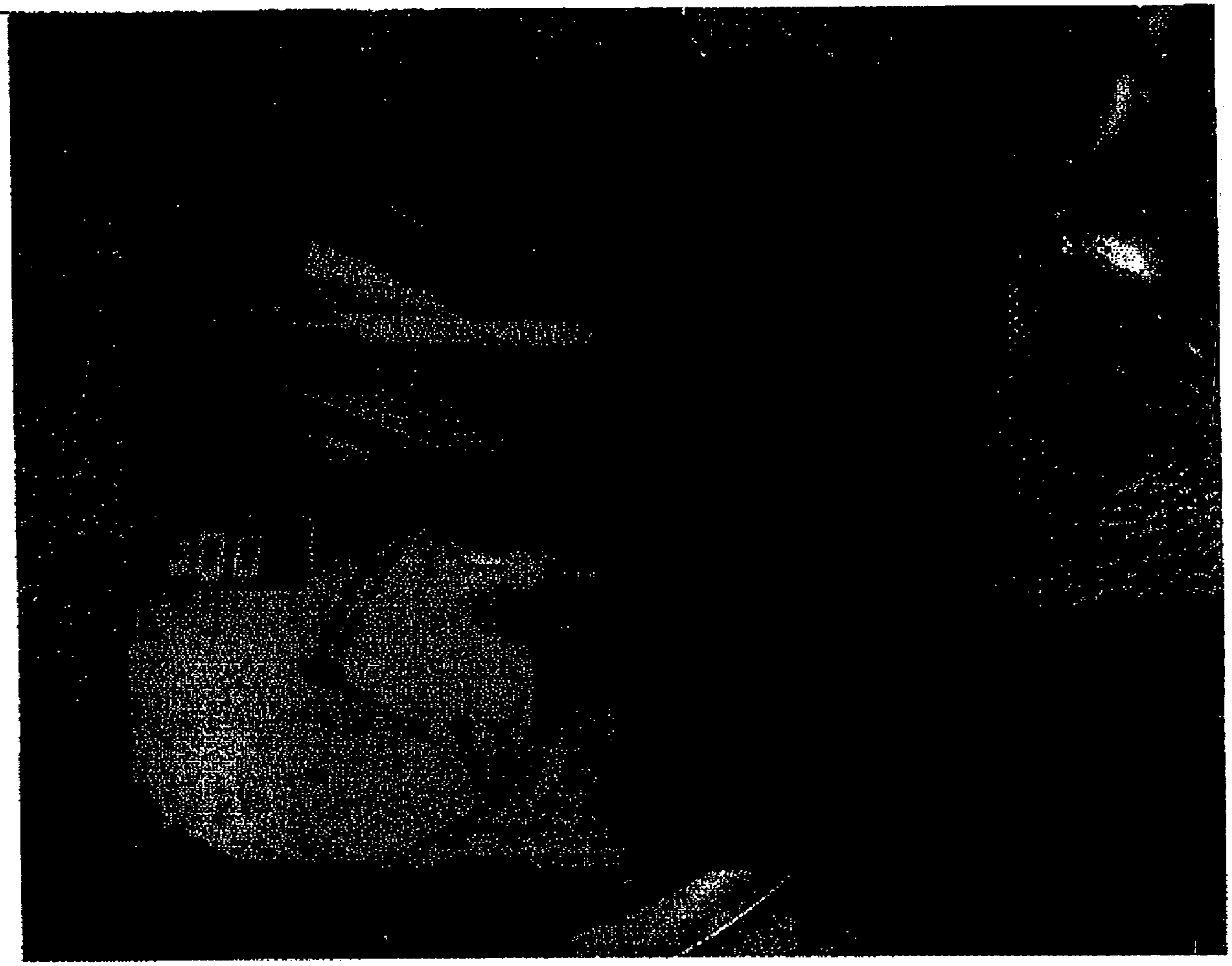
When you print color separations, the screen angles are set automatically. If you change these settings incorrectly, your image might not print properly.

Screen technology

The screen technology should be set to match the type of imagesetter your service bureau will be using. Talk to your service bureau to determine the correct setting. If you are not using an imagesetter or if you are unable to speak to your service bureau, use the standard defaults.

Halftone type

The halftone type refers to the type of dot that is being used to create the halftone. Typically, a halftone screen consists of rows of evenly spaced round, or diamond-shaped dots. However, it is possible to use halftone screens that have dots that are shaped differently. In fact, halftone screens can even use straight



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COMMERCIAL PRINTING GUIDE

Corel® Commercial Printing Guide

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Printing Continuous-Tone Images Using Halftone Screens

A continuous-tone image is an image that contains smooth transitions between shades, such as a photograph. Printing continuous-tone images is a problem because printing presses can't reproduce shading.

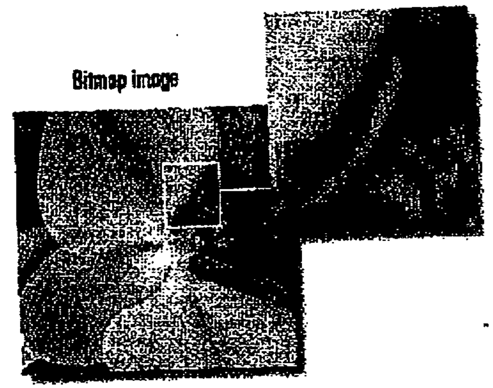
Printing presses can't reproduce shading because each portion of a printing plate can either be inked or not inked, but there can be no in-between. This means that any portion of an image is either completely dark or completely light.

You can create the illusion of shading on a printing press by printing images made up of tiny dots. The size of the dots determines the different levels of shading (i.e., bigger dots produce darker shades). A halftone screen is required to convert images with true shading into images made up of tiny dots.

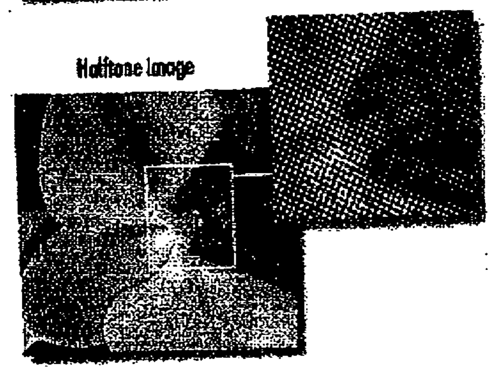
Traditionally, halftone screens are opaque screens with thousands of tiny holes. An image with shading is photographed through this screen using special photographic paper or film. The resulting image, which consists entirely of dots, is then used to create printing plates.

Today, desktop publishing applications let you create halftone images without using physical screens or cameras. This means that computers can simulate the effect of a halftone screen on a bitmap.

Bitmap image



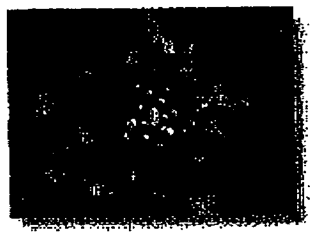
Halftone image



Reproducing Color Using Color Separations

To reproduce multicolor images, each color element in an image must be isolated and transferred to a separate sheet of film. This sheet of film, called a color separation, is used to create the printing plate for one color of ink. This process is necessary because a printing press can only apply one color of ink to a sheet of paper at a time.

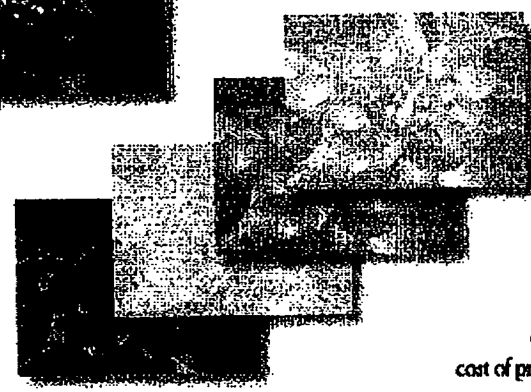
There are two methods of color reproduction you can use: process color and spot color. The primary difference between these two methods is the number of color separations required to reproduce each color.



Process Color

Although your image may contain thousands of colors, you won't require thousands of color separations. To reproduce full-color images, only four inks are required: cyan (C), magenta (M), yellow (Y), and black (K). Color produced in this way is called process color or CMYK color.

Almost any color can be produced by mixing percentages of these four inks. However, because these inks are mixed on the press, the colors that result do not always precisely match the colors represented on your monitor.



Also, because printing plates are not always perfectly aligned, fine detail can sometimes appear blurry in process colors. These problems are usually marginal and can often be solved by taking special care and by inspecting press proofs.

Spot Color

Spot color uses a different ink for each color and each color requires its own color separation. If your publication only includes one or two colors, using spot colors is an economical alternative to process color. Otherwise, you can use spot colors when the result of using process colors isn't precise enough. For example, if you are trying to produce a very specific color, perhaps for a corporate logo, or if detail is critical, as with fine colored text, you should use spot color. Bear in mind, however, that each additional spot color requires extra plates and ink, adding to the cost of printing.